

## PATENT ABSTRACTS OF JAPAN

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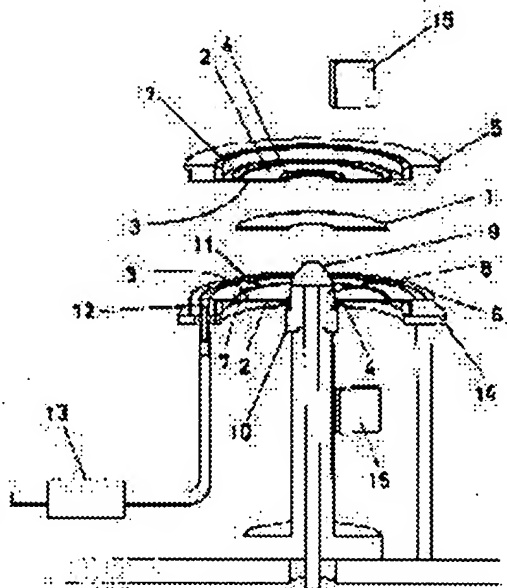
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## (54) MAGNETIC TRANSFER DEVICE AND MASTER FOR MAGNETIC TRANSFER

## (57)Abstract:

PROBLEM TO BE SOLVED: To make it possible to surely perform magnetic transfer with accurate positioning between a master for magnetic transfer and a magnetic disk.

SOLUTION: This magnetic transfer device is provided with a master 2 for magnetic transfer which has a magnetic film formed on one side of a substrate for transferring to a magnetic disk 1 and has a positioning ring 4, an elastic spindle 8 inserted through the center hole of the magnetic disk 1 and the center hole of the positioning ring 4, a spindle deforming means 9 for compressing and deforming the elastic spindle 8 in the axial direction, two flanges 5, 6 arranged on the outer peripheral parts of the two sheets of masters 2 for magnetic transfer, two flexible members 7 for coupling the two flanges 5, 6 to the two sheets of masters 2 for magnetic transfer, and a gas exhausting means for exhausting the gas between the magnetic disk 1 and the masters 2 for magnetic transfer. Thus, when the master 2 and the magnetic disk are closely adhered with each other, both are tightly adhered to each other with high reliability of transfer, and accurately positioned.



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CLAIMS

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## [Claim(s)]

[Claim 1] Magnetic-transfer equipment equipped with the master for magnetic transfer which the magnetic film which performs magnetic transfer to said slave by sticking to a slave and impressing a field is formed in one side of a substrate, and has a main bore, the main bore of said slave and the elastic spindle \*\*\*\*(ed) by the main bore of said master for magnetic transfer, and a spindle deformation means to carry out the compression set of said elastic spindle to shaft orientations.

[Claim 2] Magnetic-transfer equipment according to claim 1 which used the configuration of a cross section perpendicular to said master substrate flat surface for magnetic transfer of an elastic spindle as the hard drum type.

[Claim 3] Magnetic-transfer equipment according to claim 1 or 2 which made mutually the configuration of the main bore of a slave, the configuration of the main bore of the master for magnetic transfer, and the configuration of a cross section parallel to the substrate flat surface of said master for magnetic transfer of an elastic spindle the non-circle configuration [ \*\*\*\* ].

[Claim 4] Two flanges prepared in the periphery section of the master for magnetic transfer of two sheets, and said master for magnetic transfer of two sheets, respectively, Two flexible members which connect said master for magnetic transfer of two sheets with said two flanges, respectively, It has a gas discharge means for discharging the gas between a slave and said master for magnetic transfer. A slave is inserted by said master for magnetic transfer of two sheets. Magnetic-transfer equipment according to claim 1, 2, or 3 which enabled discharge of the gas of the closed space formed by said two flanges, said two flexible members, said master for magnetic transfer of two sheets, and said elastic spindle with said gas discharge means.

[Claim 5] The master for magnetic transfer equipped with the locating ring with which the magnetic film which performs magnetic transfer to said slave by sticking to a slave and impressing a field, and this magnetic film were formed in one side, it fixed to the periphery of said opening of the near field in which the magnetic film of the substrate which has opening at the core, and said substrate is not formed, and the main bore was formed.

[Claim 6] The master for magnetic transfer according to claim 5 which made the diameter of the main bore of a locating ring larger than the diameter of the main bore of a slave.

[Claim 7] The master for magnetic transfer according to claim 5 or 6 which established the slot on the radial which leads to the rim of said substrate in the field in which the magnetic film of a substrate was formed.

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the magnetic-transfer equipment and the magnetic-transfer master which imprint the information on the master equipped with the information signal to a slave by making into a slave the magnetic-disk medium used for a hard disk drive unit or a floppy disk drive unit.

[0002]

[Description of the Prior Art] The object with which surface recording density already exceeds 1 Gbit/sqin is commercialized, and, several years after, as for the hard disk drive which are current and a typical magnetic disk drive, technical progress rapid like it argues about utilization of 10 Gbit/sqin will be accepted. The place which depends on the magnetic-resistance-element mold head on which improvement in track recording density can also reproduce a signal with a width of recording track of several [ only ] micrometers with sufficient SN with last thing at the technological background which made such high recording density possible is size.

[0003] Now, in order for a head to scan such a narrow track correctly, the role with the important tracking servo technique of a head is played. At the present hard disk drive using such a tracking servo technique, the servo signal for tracking, an address information signal, a playback clock signal, etc. are recorded at fixed include-angle spacing among 1 round of a disk. The head is enabled for drive equipment to detect the location of a head with these signals reproduced with a fixed time interval, to correct from a head, and to scan a truck top correctly.

[0004] Since the servo signal and address information signal which were mentioned above, a playback clock signal, etc. turn into a reference signal for a head to scan a truck top correctly, the positioning accuracy high for writing in (it being hereafter described as former TINGU) is required for them. In the current hard disk drive, a recording head is positioned using the servo system (following servo writer) of dedication incorporating the high precision location detection equipment using an optical interference, and former TINGU is performed.

[0005] However, the technical problem of the following [ TINGU / by the above-mentioned servo writer / former ] exists. Writing in a signal over many trucks takes much time amount as the 1st technical problem first, positioning a head with high precision. Many servo writers must be worked to coincidence to raise productivity. Then, as the 2nd technical problem, a large amount of cost starts installation of many servo writers, and a maintenance. They are so serious that track density of these technical problems improves and its number of trucks increases.

[0006] Then, the method which carries out the package imprint of the information on a master at a magnetic disk is proposed by giving the energy for an imprint for the magnetic disk which should carry out former TINGU of former TINGU not with a servo writer but with the disk called the master in which all servo information was written beforehand from the superposition exterior. The important technical problem of this method is how to stick a master and a slave disk without a clearance. As an approach of solving this technical problem, while making the surface roughness and the wave of a

master and a slave disk as small as possible, it is discharging the air between a master and a slave disk. [0007] Drawing 11 is magnetic-transfer equipment shown in JP,7-78337,A. The sign used by the following explanation gives a different sign from the object of description to this official report. In this drawing, an arm for 18 to press an elastic body and for 19 press an elastic body and 20 are magnetic poles which carry out the seal of approval of the field of an imprint. According to this official report, by pressing the up-and-down arm 19 in the direction of an arrow head, the magnetic disk 1 and master 22 which were inserted with the up-and-down elastic body 18 are stuck extensively, and it is supposed that magnetic transfer is performed.

[0008]

[Problem(s) to be Solved by the Invention] However, in the magnetic-transfer equipment of the above-mentioned official report, in order to make homogeneity distribute the local thrust by the arm 19 all over a master 2, it is necessary to enlarge thickness of an elastic body, and the magnetic pole 20 which impresses the field of an imprint cannot be brought close to master 22 front face, and sufficient field cannot be impressed.

[0009] Moreover, it has the technical problem that the air which air was easy to be shut up between the magnetic disk 1 and the master 22, and was once shut up is difficult to discharge, and a master 2 and a magnetic disk 1 cannot be stuck even if it makes a uniform pressure act on a master 22 with an elastic body 18. Furthermore, a relative location arrangement of a master 22 and a magnetic disk 1 is difficult, and has the technical problem that the positioning accuracy of the magnetic pattern imprinted by the magnetic disk 1 is low.

[0010] Therefore, the purpose of this invention solves the above-mentioned technical problem, and its positioning accuracy of the master for magnetic transfer and a slave disk is high, and it is offering the magnetic-transfer equipment and the master for magnetic transfer which can perform magnetic transfer certainly.

[0011]

[Means for Solving the Problem] In order to solve the above-mentioned technical problem, the magnetic-transfer equipment of this invention according to claim 1 was equipped with the master for magnetic transfer which the magnetic film which performs magnetic transfer to a slave is formed in one side of a substrate, and has a main bore, the main bore of a slave and the elastic spindle \*\*\*\*(ed) by the main bore of the master for magnetic transfer, and a spindle deformation means to carry out the compression set of the elastic spindle to shaft orientations, by sticking to a slave and impressing a field.

[0012] Thus, the master for magnetic transfer which the magnetic film which performs magnetic transfer to a slave by sticking to a slave and impressing a field is formed in one side of a substrate, and has a main bore, Since it had the elastic spindle \*\*\*\*(ed) by the main bore of a slave, and the main bore of the master for magnetic transfer, and a spindle deformation means to carry out the compression set of the elastic spindle to shaft orientations Relative location doubling of the master for magnetic transfer and a slave is correctly performed by the elastic spindle in the process in which the master for magnetic transfer and a slave are stuck. That is, if an elastic spindle is made to deform with a spindle deformation means and the thickness of an elastic spindle is decreased, the diameter of an elastic spindle tends to become large, from the inside of the main bore of a slave or the master for magnetic transfer, can be changed into a lining condition and can be positioned. For this reason, when sticking the master for magnetic transfer, and a slave, since the magnetic pattern which both stick closely and the dependability of an imprint is not only high, but is imprinted is positioned correctly at the core of a slave, the operation effectiveness that the engine performance of magnetic disk drive equipment becomes high is acquired.

[0013] Magnetic-transfer equipment according to claim 2 used the configuration of a cross section perpendicular to the master substrate flat surface for magnetic transfer of an elastic spindle as the hard drum type in claim 1. Thus, the effectiveness which sticks the master for magnetic transfer to a slave by pressure increases further at the same time an elastic spindle positions the master for magnetic transfer to a slave, since the configuration of a cross section perpendicular to the master substrate flat surface for magnetic transfer of an elastic spindle was used as the hard drum type.

[0014] Magnetic-transfer equipment according to claim 3 made mutually the configuration of the main bore of a slave, the configuration of the main bore of the master for magnetic transfer, and the configuration of a cross section parallel to the substrate flat surface of the master for magnetic transfer of an elastic spindle the non-circle configuration [ \*\*\*\* ] in claims 1 or 2. Thus, since the configuration of the main bore of a slave, the configuration of the main bore of the master for magnetic transfer, and the configuration of a cross section parallel to the substrate flat surface of the master for magnetic transfer of an elastic spindle were mutually made into the non-circle configuration [ \*\*\*\* ], not only the center position at the time of adhesion of a slave and the master for magnetic transfer but a rotation phase can be doubled. That is, the non-circle configuration of a main bore serves as a mark of the phase of the hand of cut of a slave, and the phase of the hand of cut of the magnetic pattern imprinted by the slave always becomes fixed to the mark. therefore, drive equipment -- many -- when incorporating the slave of several sheets, since the rotation phase of those magnetic patterns can also be arranged, there is the operation effectiveness that the rate at which the head of drive equipment discovers a desired magnetic pattern becomes quick.

[0015] Magnetic-transfer equipment according to claim 4 is set to claims 1, 2, or 3. The master for magnetic transfer of two sheets, Two flanges prepared in the periphery section of the master for magnetic transfer of two sheets, respectively, Two flexible members which connect the master for magnetic transfer of two sheets with two flanges, respectively, It has a gas discharge means for discharging the gas between a slave and the master for magnetic transfer. The slave was inserted by the master for magnetic transfer of two sheets, and discharge of the gas of the closed space formed by two flanges, two flexible members, the master for magnetic transfer of two sheets, and the elastic spindle was enabled with the gas discharge means.

[0016] Thus, since discharge of the gas of the closed space which sandwiches a slave by the master for magnetic transfer of two sheets, and is formed by two flanges, two flexible members, the master for magnetic transfer of two sheets, and the elastic spindle was enabled with the gas discharge means, the air between the master for magnetic transfer and a slave is discharged efficiently, and the pressure of a closed space becomes lower than atmospheric pressure. Consequently, the master for magnetic transfer of two sheets receives the force in the direction which sandwiches a slave with an atmospheric pressure, and is strongly stuck to the imprint side of the master for magnetic transfer, and the front face of a slave.

[0017] By sticking to a slave and impressing a field, the magnetic film which performs magnetic transfer to a slave, and this magnetic film were formed in one side, and the master for magnetic transfer according to claim 5 was equipped with the locating ring with which it fixed to the periphery of opening of the near field in which the magnetic film of the substrate which has opening at the core, and a substrate is not formed, and the main bore was formed. Thus, since it has the locating ring with which the magnetic film which performs magnetic transfer to a slave by sticking to a slave and impressing a field, and this magnetic film were formed in one side, it fixed to the periphery of opening of the near field in which the magnetic film of the substrate which has opening at the core, and a substrate is not formed, and the main bore was formed, relative location doubling of a master and a slave is made by \*\*\*\*(ing) an elastic spindle to the bore of a locating ring and a slave. Moreover, since the locating ring is separated by the thickness of a substrate to the slave, even if the bore of the main bore of a slave varies by \*\*\*\*(ing) an elastic spindle to the main bore of a locating ring and a slave, deformation of an elastic spindle can follow it and positioning accuracy becomes high.

[0018] The master for magnetic transfer according to claim 6 made the diameter of the main bore of a locating ring larger than the diameter of the main bore of a slave in claim 5. Thus, since the diameter of the main bore of a locating ring was made larger than the diameter of the main bore of a slave, the component of a force of the force in which an elastic spindle extends a locating ring can be turned in the direction of a slave. That is, a master is stuck to a slave by pressure at the same time an elastic spindle positions a locating ring to a slave.

[0019] The master for magnetic transfer according to claim 7 established the slot on the radial which leads to the rim of a substrate in claims 5 or 6 in the field in which the magnetic film of a substrate was

formed. Thus, since the slot on the radial which leads to the rim of a substrate was established in the field in which the magnetic film of a substrate was formed, the gas between a slave and a substrate can be discharged through this slot, and adhesion improves.

[0020]

[Embodiment of the Invention] The gestalt of implementation of the 1st of this invention is explained based on drawing 1 R> 1 - drawing 7. However, the same number is given to the same component as the conventional example, and explanation is omitted. It is the strabism sectional view of the assembly condition of the magnetic-transfer equipment using the master for magnetic transfer and it. [ in / drawing 2 (a) the strabism sectional view of the decomposition condition of the master for magnetic transfer which uses drawing 1 for the equipment for magnetic transfer and it in the gestalt of implementation of the 1st of this invention, the perspective view of the master for magnetic transfer in the gestalt of implementation of the 1st of this invention, and (b), and / in drawing 3 / the gestalt of implementation of the 1st of this invention ] [ the enlarged drawing of that important section ] As shown in drawing 1, this magnetic-transfer equipment is equipped with the master 2 for magnetic transfer, the elastic spindle 8, the flanges 5 and 6 of 9 or 2 caps, the flexible film 7, and a gas discharge means. 3 is the imprint side of a master 2 in which the magnetic film for imprinting information to a magnetic disk 1 was formed. The magnetic film which can imprint a magnetic pattern to a magnetic disk 1 by sticking the master 2 for magnetic transfer to a magnetic disk (slave) 1, and impressing a field, It has the locating ring 4 with which it fixed to the periphery of opening of the near field, i.e., the imprint side 3 and the field of the opposite side, where this magnetic film is formed in the imprint side 3 of one side, and the magnetic film of the substrate which has opening, and a substrate is not formed in the core, and the main bore was formed. In drawing 2, 16 is the above-mentioned magnetic film, and 17 is the slot established in the imprint side 3 in which the magnetic film 16 of a master 2 is formed at the radial, and leads to the rim of a substrate.

[0021] The elastic spindle 8 consists of the elastic body \*\*\*\*(ed) by the main bore of a magnetic disk 1, and the main bore of the master 2 of two sheets. Cap 9 is a spindle deformation means for crushing the elastic spindle 8 up and down, and carrying out a compression set to shaft orientations. In this case, the elastic spindle 8 is a cylindrical shape-like, and the mandril of cap 9 is inserted in the core. 10 is a master plinth for supporting one [ the elastic spindle 8 and ] master 2. Two flanges 5 and 6 are formed in the periphery section of the masters 2 and 2 for magnetic transfer of two sheets, respectively, the upper flange 5 holds one side of the master 2 of two sheets, and the bottom flange 6 holds another side. 14 is a flange plinth supporting a bottom flange. The flexible film (flexible member) 7 connects the masters 2 and 2 for magnetic transfer of two sheets with two flanges 5 and 6, respectively. Moreover, an air exhaust port for an air duct for 11 to discharge the air between a master 2 and a magnetic disk 1 and 12 to discharge air from an air duct and 13 are the suction pumps connected to the air exhaust port. these air ducts 11 and the air exhaust port 12 -- be alike suction pump 13 -- a gas discharge means is constituted and the gas between a magnetic disk 1 and the master 2 for magnetic transfer is discharged. 15 is a magnet for imprinting the magnetic pattern of a master 2 to a magnetic disk 1.

[0022] Next, actuation of the master for magnetic transfer of the above-mentioned configuration and magnetic-transfer equipment is explained. As shown in drawing 3, first, a magnetic disk 1 is inserted into two masters 2, and both the main bores of a locating ring 4 and a magnetic disk 1 are \*\*\*\*(ed) by the elastic spindle 8. Moreover, the upper flange 5 and the bottom flange 6 are joined at this time. Next, thickness of the elastic cylindrical shape-like spindle 8 is decreased by moving cap 9 in the direction of an arrow head A. At this time, the diameter of the elastic cylindrical shape-like spindle 8 tends to become large, and as shown in drawing 4, from the inside of the feed hole of a locating ring 4 or a magnetic disk 1, they are changed into a lining condition and it positions them.

[0023] If positioning of a magnetic disk 1 and a master 2 is completed with the elastic spindle 8, the elastic spindle 8 will discharge air from the air exhaust port 12 with a suction pump 13 with a deformation condition. As shown in drawing 4, if the magnetic disk 1 forms the closed space surrounded by the flexible film 7 of the upper flange 5 and 6 or 2 bottom flanges, the master 2 of 7 or 2 sheets, 2 or 2 locating rings 4 and 4, and the elastic spindle 8 and air is discharged from the air exhaust

port 12, the pressure in it will become lower than atmospheric pressure. Consequently, the masters 2 and 2 of two sheets receive the force in the direction which sandwiches a magnetic disk 1 with an atmospheric pressure, and are strongly stuck to the imprint side 3 of a master 2, and the front face of a magnetic disk 1.

[0024] If adhesion of a magnetic disk 1 and a master 2 is completed, as shown in drawing 5, a magnet 15 will be made to approach a master 2 and a field required for an imprint will be impressed. Moreover, it can imprint over all the circumferential directions of a magnetic disk 1 by making the circumferential direction of a magnetic disk 1 rotate a magnet 15. In the above, although the configuration and actuation of the master for magnetic transfer in the gestalt of implementation of the 1st of this invention and magnetic-transfer equipment were explained, an operation of a locating ring 4 and the elastic spindle 8 and actuation are explained in more detail using drawing 6 and drawing 7. The explanatory view before deformation of an elastic spindle in case the explanatory view before deformation of the elastic spindle of the master [ in / in drawing 6 (a) / the gestalt of implementation of the 1st of this invention ] for magnetic transfer and magnetic-transfer equipment and (b) do not have an explanatory view after that deformation and drawing 7 (a) does not have a locating ring, and (b) are the explanatory views after that deformation.

[0025] Even if in the case of drawing 7 the diameter of the main bore of a magnetic disk 1 is too larger than the diameter of the main bore of a master 2 and it is too small, since deformation of the elastic spindle 8 cannot be followed, it cannot position, but it is necessary to make very small dispersion in the bore of the main bore of a magnetic disk 1. In the case of drawing 6, the locating ring 4 has fixed to the magnetic disk 1, and if the bore of phim and the main bore of a locating ring 4 is set [ the bore of the main bore of a magnetic disk 1 ] to phik for the bore of phis and the main bore of the substrate of a master 2, those size relation is  $\phi s < \phi k < \phi m$ .

[0026] Therefore, if the elastic spindle 8 of a cylindrical shape is compressed in the thickness direction and expands in the diameter direction, as shown in drawing 6 R> 6 (b), the elastic spindle 8 will contact a magnetic disk 1 and a locating ring 4, and will position them on the same axle relatively. Since the locating ring 4 is separated by the thickness of the substrate of a master 2 to the magnetic disk 1, even if bore phis of the main bore of a magnetic disk 1 varies, deformation of the elastic spindle 8 can follow it and its positioning accuracy is high.

[0027] Here, bore phik of the main bore of a locating ring 4 is made larger than bore phis of the main bore of a magnetic disk 1 for turning the component of a force of the force in which the elastic spindle 8 extends a locating ring 4 in the direction of a magnetic disk 1. That is, a master 2 is stuck to a magnetic disk by pressure 1 at the same time the elastic spindle 8 positions a locating ring 4 to a magnetic disk 1.

[0028] Since it is positioned to the center position of a magnetic disk 1 correctly [ since the adhesion of a magnetic disk 1 and a master 2 is good / the center position of the magnetic pattern the dependability of an imprint is not only high, but imprinted by the magnetic disk 1 ] according to the gestalt of implementation of this invention as explained above, the head of drive equipment can read a magnetic pattern correctly.

[0029] Moreover, drawing 8 (a) is an explanatory view before deformation of the elastic spindle of the modification of the gestalt of implementation of the 1st of this invention, and (b) is an explanatory view after that deformation. As shown in drawing 8, the configuration of a cross section perpendicular to the master substrate flat surface for magnetic transfer of an elastic spindle is used as the hard drum type. Thereby, the effectiveness which sticks a master 2 to a magnetic disk 1 by pressure becomes still higher at the same time the elastic spindle 8 positions.

[0030] The gestalt of implementation of the 2nd of this invention is explained based on drawing 9 and drawing 10. The top view of the master [ in / in drawing 9 / the gestalt of implementation of the 2nd of this invention ] for magnetic transfer and an elastic spindle and drawing 10 are the top views of the magnetic disk in the gestalt of implementation of the 2nd of this invention. As shown in drawing 9, unlike the gestalt of the 1st operation, the configuration of a cross section perpendicular to the shaft of the elastic spindle 8 is not a circle but elliptical. Moreover, the main bore of the locating ring 4 which



fixes to a master 2 is also elliptical [ \*\*\*\* / the cross-section configuration of the elastic spindle 8 instead of a circle ]. Furthermore, as shown in drawing 10 , the main bore of a magnetic disk 1 is also elliptical [ \*\*\*\* / the cross-section configuration of the elastic spindle 8 ].

[0031] By doing in this way, not only the center position at the time of adhesion of a master 2 but a rotation phase can be doubled with a magnetic disk 1. That is, in the direction of a major axis of the ellipse of the main bore of a magnetic disk 1, the magnetic pattern of the direction of a major axis of the ellipse of the main bore of a master 2 will surely be imprinted. Other configurations are the same as that of the gestalt of the 1st operation.

[0032] Since the main bore of a magnetic disk 1 is un-circular according to the gestalt of this operation as explained above, it serves as a mark of the phase of the hand of cut of a magnetic disk 1, and the phase of the hand of cut of the magnetic pattern imprinted by the magnetic disk 1 always becomes fixed to that mark. therefore, drive equipment -- many -- when incorporating the magnetic disk 1 of several sheets, since the rotation phase of those magnetic patterns can also be arranged, it is effective in the rate at which the head of drive equipment discovers a desired magnetic pattern becoming quick. In addition, as long as the main bore of a magnetic disk 1, the main bore of a locating ring 4, and the cross-section configuration of an elastic spindle are similarities mutually, non-circle configurations, such as a rhombus and a rectangle, are sufficient as them.

[0033]

[Effect of the Invention] The master for magnetic transfer which the magnetic film which performs magnetic transfer to a slave by according to the magnetic-transfer equipment of this invention according to claim 1 sticking to a slave and impressing a field is formed in one side of a substrate, and has a main bore, Since it had the elastic spindle \*\*\*\*(ed) by the main bore of a slave, and the main bore of the master for magnetic transfer, and a spindle deformation means to carry out the compression set of the elastic spindle to shaft orientations Relative location doubling of the master for magnetic transfer and a slave is correctly performed by the elastic spindle in the process in which the master for magnetic transfer and a slave are stuck. For this reason, when sticking the master for magnetic transfer, and a slave, since the magnetic pattern which both stick closely and the dependability of an imprint is not only high, but is imprinted is positioned correctly at the core of a slave, the operation effectiveness that the engine performance of magnetic disk drive equipment becomes high is acquired.

[0034] In claim 2, the effectiveness which sticks the master for magnetic transfer to a slave by pressure increases further at the same time an elastic spindle positions the master for magnetic transfer to a slave, since the configuration of a cross section perpendicular to the master substrate flat surface for magnetic transfer of an elastic spindle was used as the hard drum type. In claim 3, since the configuration of the main bore of a slave, the configuration of the main bore of the master for magnetic transfer, and the configuration of a cross section parallel to the substrate flat surface of the master for magnetic transfer of an elastic spindle were mutually made into the non-circle configuration [ \*\*\*\* ], not only the center position at the time of adhesion of a slave and the master for magnetic transfer but a rotation phase can be doubled. That is, the non-circle configuration of a main bore serves as a mark of the phase of the hand of cut of a slave, and the phase of the hand of cut of the magnetic pattern imprinted by the slave always becomes fixed to the mark. therefore, drive equipment -- many -- when incorporating the slave of several sheets, since the rotation phase of those magnetic patterns can also be arranged, there is the operation effectiveness that the rate at which the head of drive equipment discovers a desired magnetic pattern becomes quick.

[0035] In claim 4, since discharge of the gas of the closed space which sandwiches a slave by the master for magnetic transfer of two sheets, and is formed by two flanges, two flexible members, the master for magnetic transfer of two sheets, and the elastic spindle was enabled with the gas discharge means, the air between the master for magnetic transfer and a slave is discharged efficiently, and the pressure of a closed space becomes lower than atmospheric pressure. Consequently, the master for magnetic transfer of two sheets receives the force in the direction which sandwiches a slave with an atmospheric pressure, and is strongly stuck to the imprint side of the master for magnetic transfer, and the front face of a slave. The magnetic film which performs magnetic transfer to a slave by according to



the master for magnetic transfer of this invention according to claim 5 sticking to a slave and impressing a field, Since it has the locating ring with which it fixed to the periphery of opening of the near field where this magnetic film is formed in one side, and the magnetic film of the substrate which has opening, and a substrate is not formed in the core, and the main bore was formed Relative location doubling of a master and a slave is made by \*\*\*\*(ing) an elastic spindle to the bore of a locating ring and a slave. Moreover, since the locating ring is separated by the thickness of a substrate to the slave, even if the bore of the main bore of a slave varies by \*\*\*\*(ing) an elastic spindle to the main bore of a locating ring and a slave, deformation of an elastic spindle can follow it and positioning accuracy becomes high.

[0036] In claim 6, since the diameter of the main bore of a locating ring was made larger than the diameter of the main bore of a slave, the component of a force of the force in which an elastic spindle extends a locating ring can be turned in the direction of a slave. That is, a master is stuck to a slave by pressure at the same time an elastic spindle positions a locating ring to a slave.

[0037] In claim 7, since the slot on the radial which leads to the rim of a substrate was established in the field in which the magnetic film of a substrate was formed, the gas between a slave and a substrate can be discharged through this slot, and adhesion improves.

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the strabism sectional view of the decomposition condition of the magnetic-transfer equipment of the gestalt of implementation of the 1st of this invention.

[Drawing 2] (a) is the perspective view of the master for magnetic transfer of the gestalt of implementation of the 1st of this invention, and (b) is that important section enlarged drawing.

[Drawing 3] It is the strabism sectional view of the assembly condition of the magnetic-transfer equipment of the gestalt of implementation of the 1st of this invention.

[Drawing 4] It is a sectional view explaining actuation of the magnetic-transfer equipment of the gestalt of implementation of the 1st of this invention.

[Drawing 5] It is a strabism sectional view explaining actuation of the magnetic-transfer equipment of the gestalt of implementation of the 1st of this invention.

[Drawing 6] With the magnetic-transfer equipment of the gestalt of implementation of the 1st of this invention, (a) is an explanatory view before deformation of an elastic spindle, and (b) is an explanatory view after that deformation.

[Drawing 7] The explanatory view before deformation of an elastic spindle in case (a) does not have a locating ring with the gestalt of implementation of the 1st of this invention, and (b) are the explanatory views after that deformation.

[Drawing 8] In the modification of the gestalt of implementation of the 1st of this invention, (a) is an explanatory view before deformation of an elastic spindle, and (b) is an explanatory view after that deformation.

[Drawing 9] They are the master for magnetic transfer of the gestalt of implementation of the 2nd of this invention, and the top view of an elastic spindle.

[Drawing 10] It is the top view of the magnetic disk of the gestalt of implementation of the 2nd of this invention.

[Drawing 11] It is the perspective view of conventional magnetic-transfer equipment.

[Description of Notations]

1 Magnetic Disk

2 Master for Magnetic Transfer

3 Imprint Side

4 Locating Ring

5 Upper Flange

6 Bottom Flange

7 Flexible Member

8 Elastic Spindle

9 Cap

10 Master Plinth

11 Airstream Way

12 Air Exhaust Port

13 Suction Pump  
14 Flange Plinth  
15 Magnet  
16 Magnetic Film  
17 Slot  
18 Elastic Body  
19 Arm  
20 Magnetic Pole

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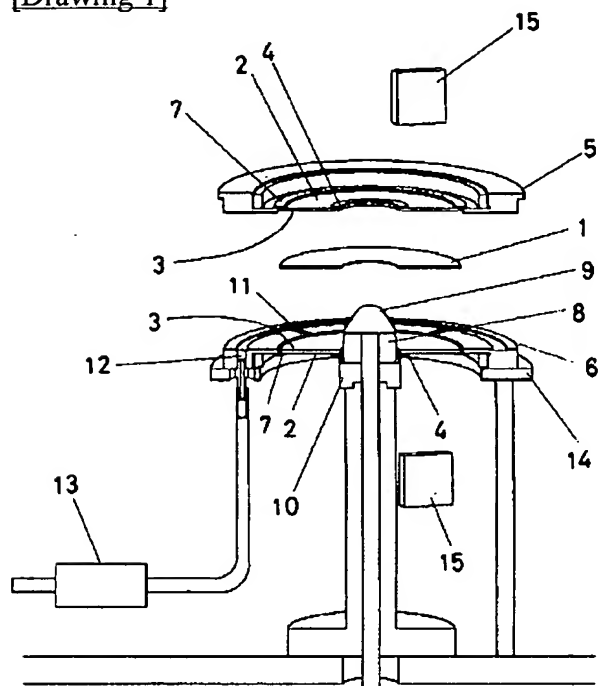
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2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

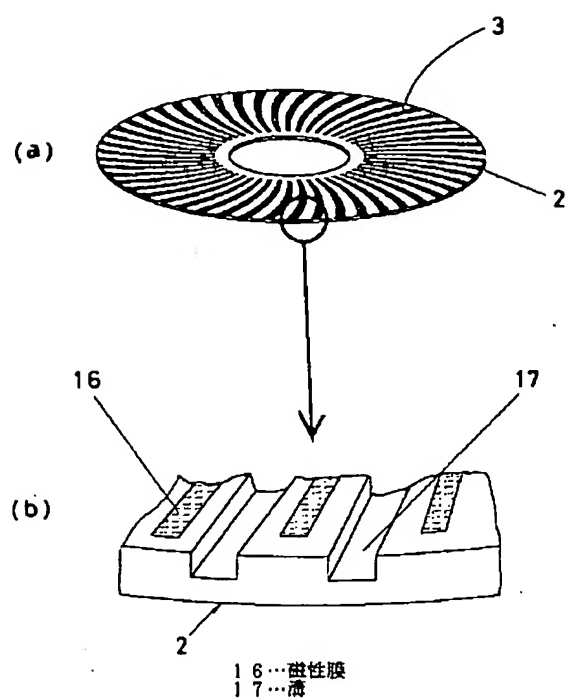
## DRAWINGS

[Drawing 1]

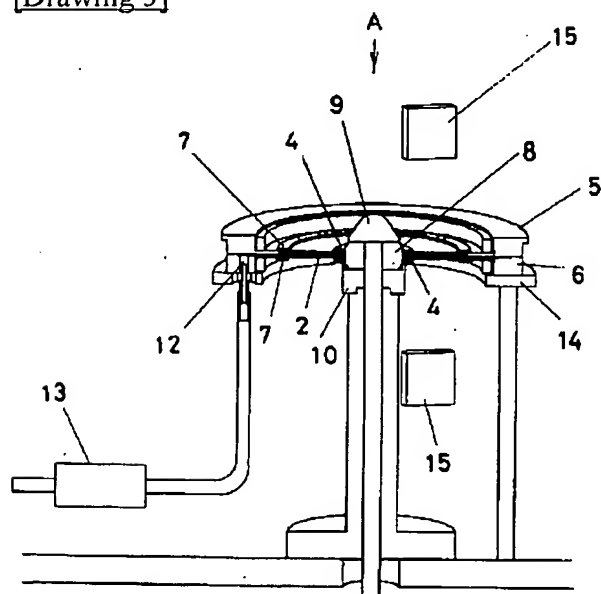


- |   |    |   |   |    |   |   |   |   |   |
|---|----|---|---|----|---|---|---|---|---|
| 1 | 磁気 | デ | イ | ク  | 7 | 可 | 性 | 部 | 材 |
| 2 | 磁気 | 磁 | 用 | マ  | 8 | 弾 | ス | ヒ | ン |
| 3 | 磁気 | 面 | ス | スタ | 9 | 性 | 洗 | ル | ド |
| 4 | 磁気 | 決 | メ | ン  | 1 | ヤ | 排 | 出 | ロ |
| 5 | 磁気 | 方 | リ | ゲ  | 2 | 空 | ボ | ン | ブ |
| 6 | 磁気 | ラ | ジ |    | 3 | 空 |   |   |   |
|   | 磁気 | 上 |   |    | 4 | 吸 |   |   |   |
|   | 磁気 | 下 |   |    | 5 |   |   |   |   |

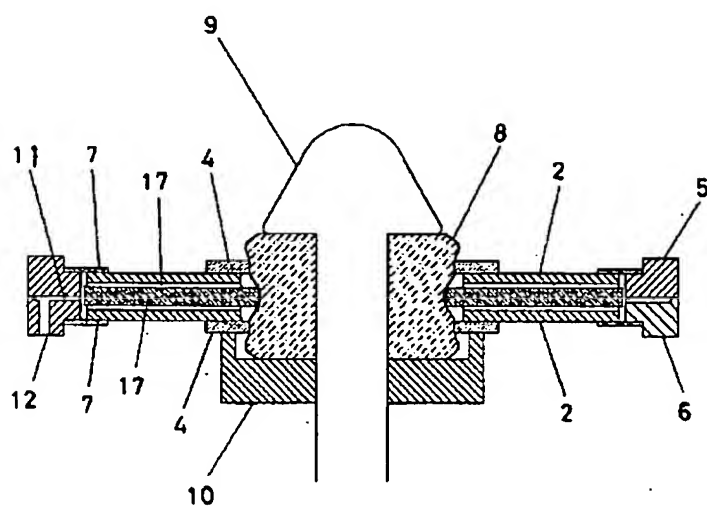
[Drawing 2]



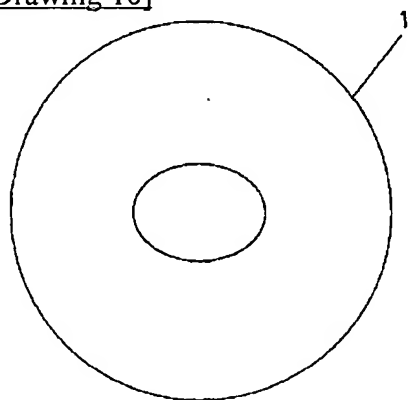
[Drawing 3]



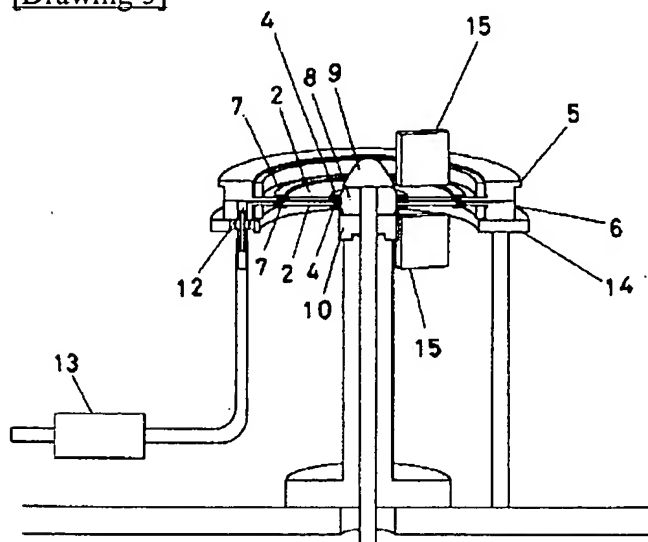
[Drawing 4]



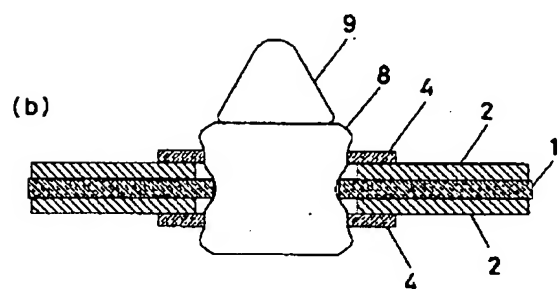
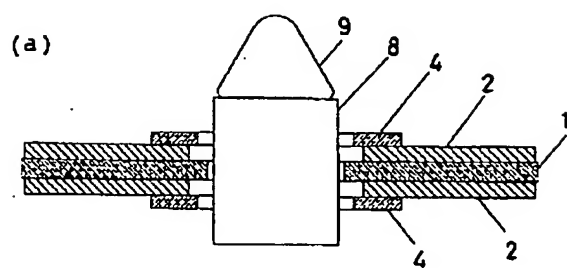
[Drawing 10]



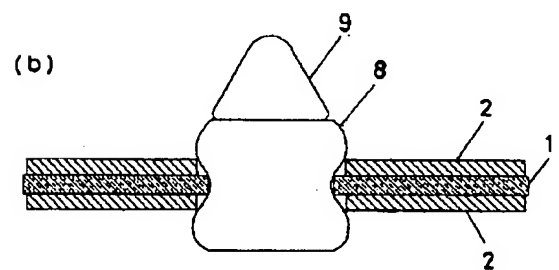
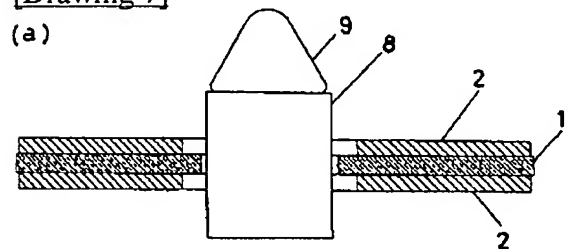
[Drawing 5]



[Drawing 6]

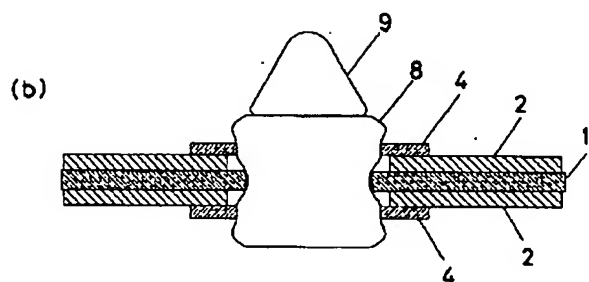
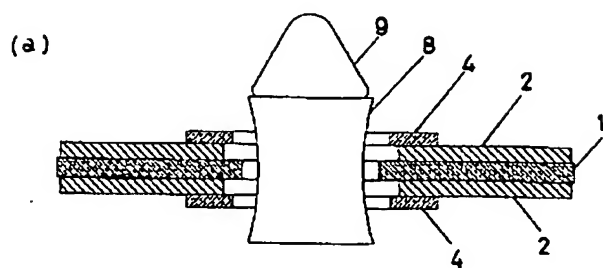


[Drawing 7]

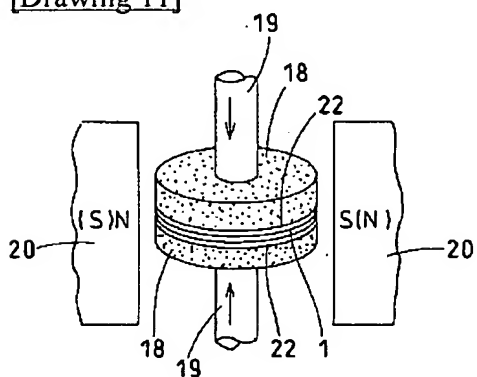


[Drawing 8]

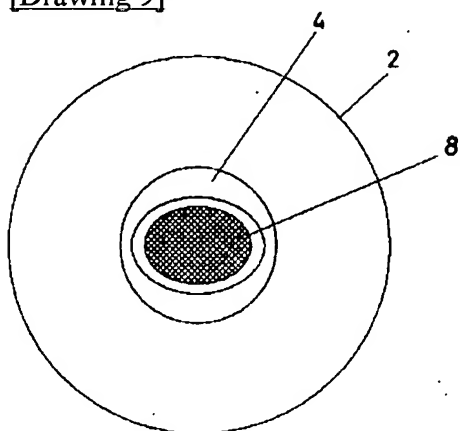




[Drawing 11]



[Drawing 9]



[Translation done.]